Volunteer Lake Assessment Program Individual Lake Reports

LAUREL LAKE, FITZWILLIAM, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	768	**Max. Depth (m):**	14.1	**Flushing Rate (yr^{-1}):**	0.4
Surface Area (Ac.):	155	**Mean Depth (m):**	6.1	**P Retention Coef:**	0.78
Shore Length (m):	3,500	**Volume (m^3):**	3,826,000	**Elevation (ft):**	1099

TROPHIC CLASSIFICATION

Year	Trophic class
1992	MESOTROPHIC
2006	OLIGOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

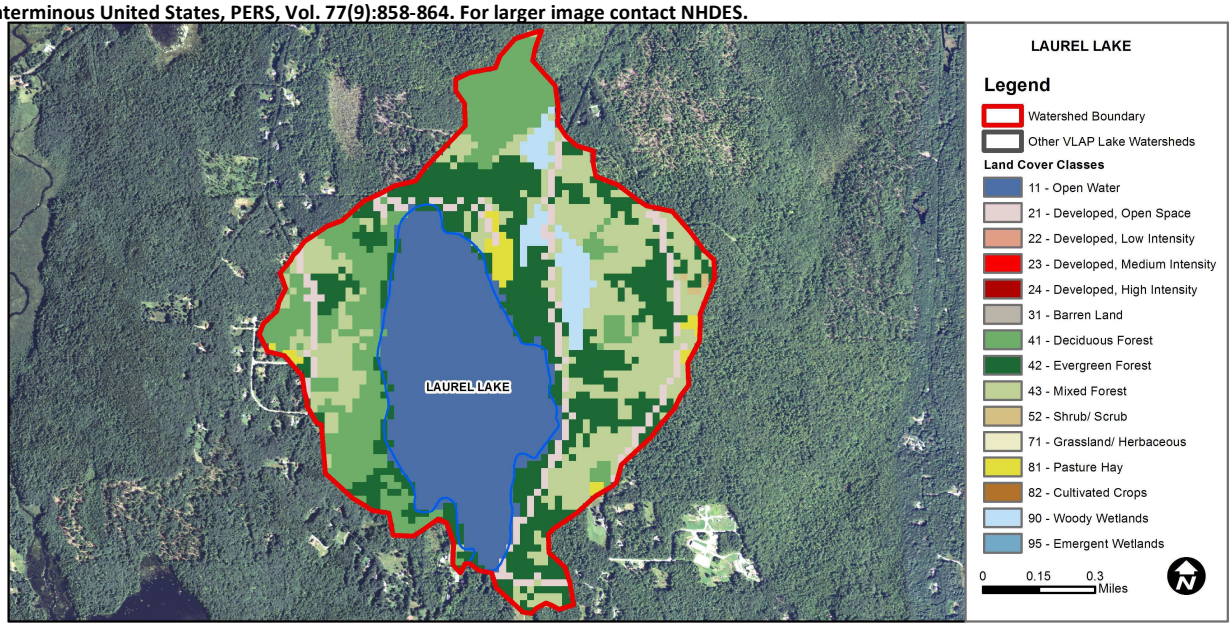
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
	pH	Bad	>10%, with a minimum of 2, samples exceed criteria, with 1 or more by a large margin.
	D.O. (mg/L)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	D.O. (% sat)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	Chlorophyll-a	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
Primary Contact Recreation	E. coli	Good	Geometric means < criteria; however at least 1 exceedance of the single sample criteria occurred.
	Chlorophyll-a	Good	At least 10 samples with 1 sample but < 10% of samples exceeding criteria.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

LAUREL LAKE - CAMP FLEUR DE LIS BEACH	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
LAUREL LAKE - TOWN BEACH	E. coli	Bad	>/=1 exceedance(s) of geometric mean criterion and/or >/=2 exceedances of single sample criterion, with 1 or more >2X criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



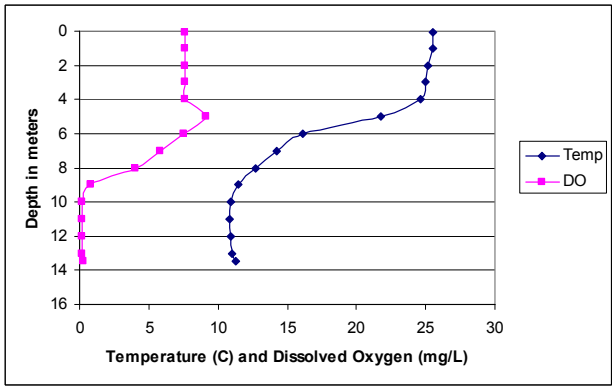
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	28.0	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	5.42	Deciduous Forest	17	Pasture Hay	1.46
Developed-Low Intensity	0	Evergreen Forest	23.68	Cultivated Crops	0
Developed-Medium Intensity	0	Mixed Forest	20.99	Woody Wetlands	3.44
Developed-High Intensity	0	Shrub-Scrub	0.17	Emergent Wetlands	0

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
LAUREL LAKE, FITZWILLIAM, NH
2012 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphic)*

- **CHLOROPHYLL-A:** Chlorophyll levels were relatively low throughout the summer. Historical trend analysis indicates a significantly decreasing (improving) chlorophyll level since monitoring began.
- **CONDUCTIVITY/CHLORIDE:** Conductivity levels were average for most NH lakes.
- **E. COLI:** E. coli levels were elevated in the Keene Ave Tributary and were consistently higher downstream at the Before Lake station. All other stations were well below state standards for public beaches and surface waters.
- **TOTAL PHOSPHORUS:** Phosphorus levels were elevated in both Keene Ave Trib stations in June and August. Tributary flow was minimal and organic matter was noted in the samples which may have contributed to the elevated phosphorus levels. Epilimnetic (upper water layer) phosphorus levels were low and historical trend analysis indicates a relatively stable phosphorus level since monitoring began.
- **TRANSPARENCY:** Transparency was well above the NH lake median and similar to 2011. However, historical trend analysis indicates a significantly decreasing (worsening) lake transparency since monitoring began.
- **TURBIDITY:** Turbidity levels were fairly low although slightly higher in the Hypolimnion (lower water layer).
- **PH:** pH was lower than desirable and potentially critical to aquatic life.
- **RECOMMENDED ACTIONS:** Although E. coli continues to be elevated in Keene Ave Tributary, numerous site visits have not identified any sources other than wildlife and/or domestic animals. However, if you feel additional bracketing is warranted contact the VLAP Coordinator in the spring for assistance. The improving chlorophyll trend is a good sign and we hope to see this continue. Keep up the great work!

Dissolved Oxygen & Temperature Profile



Station Name	Alk. mg/l	Chlor-a ug/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m NVS	Trans. m VS	Turb. ntu	pH
Deep Epilimnion	2.63	2.63	44.4		6	5.88	6.68	0.67	6.44
Deep Metalimnion			44.7		7			0.86	6.15
Deep Hypolimnion			48.4		17			1.96	5.65
Keene Ave Trib			44.3	140	53			1.32	5.24
Keene Ave Trib Before Lake			43.6	320	52			1.07	5.24
North Beach				3					
Swim Club				10					

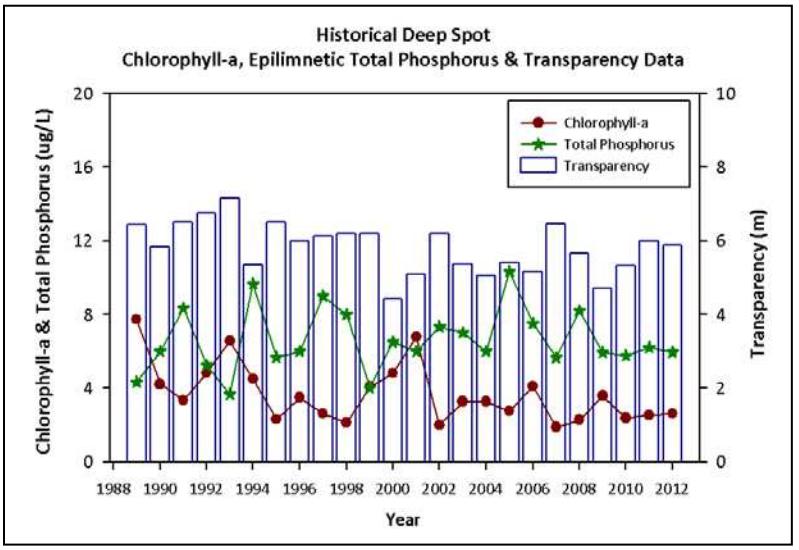
Table 1. 2012 Average Water Quality Data for LAUREL LAKE

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation
Chlorophyll-a	Improving	Significantly decreasing chlorophyll.
Transparency	Degrading	Significantly decreasing (worsening) transparency.
Phosphorus (epilimnion)	Stable	Data not significantly increasing or decreasing.



This report was generated by the NH DES Volunteer Lake Assessment Program (VLAP). For more information contact:
Sara Steiner
PO Box 95
Concord, NH 03302-0095
(603) 271-2658
sara.steiner@des.nh.gov